

AMENDMENTS TO THE CLAIMS

This listing of the claims will replace all prior versions, and listings, of claims in the application.

Listing of the Claims

Claims 1-2 (Cancelled)

3. (Currently Amended) A method for the measurement of differential heat flux, said method comprising the steps of:

- (a) providing a heat transfer reference surface;
- (b) providing a heat transfer fouling surface;
- (c) providing a heat transfer path capable of transferring heat flux between said reference surface and said fouling surface;
- (d) providing a pair of heat flux sensors, one of said sensors connected to said reference surface and the other one of said sensors connected to said fouling surface;
- (e) measuring heat flux values directly from each said sensor without having to measure temperature difference between said sensors;
- (f) calculating differential heat flux data across said heat transfer path from said heat flux values; **and**
- (g) utilizing said differential heat flux data to detect and quantify deposit accumulation at said fouling surface[.]; **and**
wherein said heat flux values at said reference surface and said fouling surface both change in response to deposit accumulation at said fouling surface.

4. (Original) The method of claim 3 wherein said differential heat flux data is calculated according to the formula $\Delta Q_t = Q_r - C \cdot Q_f$.

5. (Previously Presented) The method of claim 3 wherein cleaning of said reference surface is provided by mechanical brushing.

6. (Previously Presented) The method of claim 4 wherein cleaning of said reference surface is provided by mechanical brushing.

7. (Previously Presented) The method of claim 3 wherein sonic waves are used to keep said reference surface clean.

8. (Previously Presented) The method of claim 4 wherein sonic waves are used to keep said reference surface clean.

Claims 9-10 (Cancelled)

11. (Currently Amended) The method of claim 3 wherein said reference surface is kept clean by adding a solution to fluid flowing to said reference surface exiting from said fouling surface.

12. (Cancelled)

13. (Previously Presented) The method of claim 11 wherein said solution is synthetic cooling fluid.

Claims 14-18 (Cancelled)

19. (Original) The method of claim 3 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

20. (Original) The method of claim 4 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

21. (Original) The method of claim 5 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

22. (Original) The method of claim 6 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

23. (Original) The method of claim 7 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

24. (Original) The method of claim 8 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

Claims 25-26 (Cancelled)

27. (Original) The method of claim 11 further comprising the steps of:

(a) generating a signal indicative of said heat flux data;
(b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

28. (Cancelled)

29. (Original) The method of claim 13 further comprising the steps of:

- (a) generating a signal indicative of said heat flux data;
- (b) transmitting said signal to a microprocessor which continuously calculates, records, and displays said heat flux data.

Claims 30-34 (Cancelled)

35. (Previously Presented) The method of claim 3 wherein said heat flux sensors are thin-film heat flux sensors.

36. (Currently Amended) The method of claim 3 wherein said heat flux sensors are responsive to a flux of heat energy at said reference surface and said fouling surface.

37. (Previously Presented) The method of claim 3 wherein said reference surface is kept clean by generation of acids or oxidizing reagents with electrochemical cells.

38. (Previously Presented) The method of claim 11, wherein said solution is an acid or chemical which prevents bio-fouling or mineral deposition.

39. (New) The method of claim 3 wherein said sensors are in thermal balance when said fouling surface is clean.

40. (New) The method of claim 3 further comprising the step of providing a heating element for introducing a heat flux into said heat transfer path.

41. (New) In a system for detecting deposit accumulation in heat-carrying fluid vessels comprising a heat transfer reference surface, a heat transfer fouling surface, a heat

transfer path between said reference surface and said fouling surface, a pair of heat flux sensors, wherein one of said sensors is connected to said reference surface and the other one of said sensors is connected to said fouling surface, a method for measuring differential heat flux across said heat transfer path, said method comprising the steps of:

- (a) providing a heating element for introducing heat flux into said heat transfer path;
- (b) transferring heat flux between said reference and fouling surfaces via said heat transfer path in response to deposit accumulation at said fouling surface;
- (c) measuring heat flux values directly from each said sensor without having to measure temperature difference between said sensors;
- (d) calculating differential heat flux data across said heat transfer path from said heat flux values;
- (e) utilizing said differential heat flux data to detect and quantify said deposit accumulation at said fouling surface; and

wherein said heat flux values at said reference surface and said fouling surface both change in response to said deposit accumulation.

42. (New) The method of claim 41, wherein said sensors are in thermal balance when said fouling surface is clean.

43. (New) The method of claim 41, wherein said heating element is independent from the heat source that provides heat energy to said heat-carrying fluid.